IAP20 Rec'd PCT/TTO 23 JAN 2006 IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Friedrich BOECKING

Based on : PCT/DE 2004/001197

Title : FUEL INJECTION DEVICE

Docket No. : R.305747

Customer No. : 02119

Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT UNDER 37 CFR 1.97(b), AND EXPLANATION OF THE RELEVANCE OF THE CITED PRIOR ART

Sir:

The undersigned hereby requests that the prior art cited on the attached prior art statement be placed of record in the application file and be considered by the examiner.

This citation of prior art is made under 37 CFR 1.97(b), since it is being filed before the mailing of the first Office Action.

The relevance of the prior art cited on the attached form PTO/SB/08a is as follows:

DE 197 32 802 A1

The invention concerns a fuel injection device for internal combustion engines, wherein the displacement of a member closing the fuel injection valve is controlled by pressure prevailing in a control chamber. The pressure prevailing in said chamber is further controlled by a pilot valve whereof the closure member can be actuated by a piezoelectric drive, the movement being transmitted via a hydraulic chamber. Said closure member comprises two sealing surfaces which co-operate with valve seats, and when it passes from one valve seat to the other, a brief discharge occurs in the control chamber, to control a brief fuel injection. In order to obtain larger amounts of injected fuel, the pilot valve can be put in open or closed position.

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DE 101 18 053 A1

This patent relates to a device having an especially piezoelectric actuator unit for operating a valve element with at least one control piston and at least one actuation piston that operates a valve closure element that interacts with at least one valve seat and separates a control bore from an outlet chamber in the closed position. A hydraulic chamber between the pistons transfers movement of the control piston to the actuating piston, which is essentially in hydraulic force equilibrium with the valve element closed.

JP 11-193763

This invention shows that to make the injection rate variable in one fuel injection cycle by freely controlling the lift of the needle of the fuel injection valve of an internal combustion engine. A needle having a differential pressure boundary plate that separates into upper portion and lower portion of a differential pressure chamber that communicates with two accumulators moves up and down to compensate each change in the capacity between those accumulators of the upper and lower portions of the piston caused by the movement thereof along with sliding movement of the electrostrictive actuator. The voltage applied to the electrostrictive actuator is gradually controlled such that the lift of the needle can be freely changed.

Examination of this application is respectfully requested.

Respectfully submitted,

Ronald E. Greigg

Registration No. 31,517 Attorney for Applicant(s)

GREIGG & GREIGG, PLLC 1423 Powhatan Street, Suite One Alexandria, VA 22314

Telephone: 703-838-5500 Facsimile: 703-838-5554

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Approved for use through 07/31/2006, OMB 0651-003

J.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE

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				Art Unit			
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Sheet	1	of	1	Attorney Docket Number	R.305	5747	

U.S. PATENT DOCUMENTS							
	Cite No.1	Document Number			Name of Patentee or	Pages, Columns, Lines, Where	
Examiner nitials*		Number	Kind Code	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Relevant Passages or Relevant Figures Appear	
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FOREIGN PATENT DOCUMENTS									
Examiner Initials*	Cite No.1	Foreign Patent Document Office ³ Number ⁴ Kind ⁵ (if known)			Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appéar	Т6	
		DE	197 32 802	Α1	02-04-1999	Friedrich Boecking			
		DE	101 18 054	Αl	10-24-2002	Wolfgang Stoecklein et al.			
		JP	11-193763		07-21-1999	Takehiko Sato et al.			
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*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.